Amendments to the Claims

The listing of claims will replace the previous version, and the listing of claims

Listing of Claims

Claims 1-8 (Cancelled)

9.   (New) A parameter adjusting device adopting HiSIM (Hiroshima-university STARC IGFET Model), which is a surface potential model wherein a formula for analysis is derived based on surface potential as a circuit design model of a semiconductor element; defining a chromosome with genes as a respective great number of parameters of the circuit design model of the semiconductor element; and optimizing said parameters using a genetic algorithm based on property measured data of the tested semiconductor element, comprising:

first portion parameter adjusting means for at least adjusting

a part of the parameters in a technological parameter group in the HiSIM which is the parameters determining the structure of the semiconductor element using the genetic algorithm based on the property measured data of the semiconductor element belonging to a long channel group, and

a part of the parameters in a mobility parameter group which is determined by the determination of a part of the parameters in the technological parameter group; and

second portion parameter adjusting means for adjusting a part of the parameters adjusted by the first portion parameter adjusting means and the parameters which require adjustment, excepting the parameters being adjusted by said first portion parameter adjusting means using the genetic algorithm based on the property measured

data of various length of channels, with reference to an adjustment result of said first parameter adjusting means, and

said first and second portion parameter adjusting means, comprising child chromosome gene determination means for obtaining the center of gravity in a vector space of a parent chromosome group, in crossover processing of the genetic algorithm, and determining genes of a child chromosome inside a hyperpolyhedron in the vector space which is determined by values of said center of gravity and the parent chromosome group.

10. (New) A parameter adjusting device according to claim 9, wherein said child chromosome gene determination means generates the genes of the child chromosome inside the hyperpolyhedron in the vector space which is determined by the values of said center of gravity and the parent chromosome group by the following equation 1.

[Equation 1]

$$C = x_p + C_p$$

$$x_k = G + \varepsilon (P_k - G)$$

$$C_k = \{ \begin{array}{l} 0 \quad (k = 0) \\ \\ r_{k-1}(x_{k-1} - x_k + C_{k-1}) \quad (k = 1...p) \end{array}$$

$$r_k = (u(0,1)^{1/k+1})$$

wherein G represents the center of gravity of selected p parent individuals, C represents a vector showing the chromosomes

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of the child individuals which will be generated, and Pk represents a vector showing the chromosomes of the selected parent individuals and wherein u(0, 1) is a uniform distribution random number of an interval [0, 1].

11. (New) A parameter adjusting device according to claim 9, wherein said portion parameter adjusting means comprises:

evaluated value calculation means obtaining both the first evaluated value based on the data of a linear scale and the second evaluated value based on the data of a log scale, in selection processing of the genetic algorithm, and determining a total of the first evaluated value and the second evaluated value as the evaluated value of said chromosomes; and

normalization means unifying a scale of the data.

12. (New) A computer-readable medium wherein a program for operating a computer as the parameter adjusting device according to claim 9 is stored.

13. (New) A parameter adjusting method adopting HiSIM (Hiroshima-university STARC IGFET Model), which is a surface potential model wherein a formula for analysis is derived based on the surface potential as a circuit design model of a semiconductor element; defining a chromosome with genes as a respective great number of parameters of the circuit design model of the semiconductor element; and optimizing said parameters using the genetic algorithm based on property measured data of a tested semiconductor element, comprising:

a first step of adjusting a part of the parameters in a technological parameter group in the HiSIM which is the parameters at least determining a structure of the semiconductor element based

on the property measured data of the semiconductor element belonging to a long channel group, and a part of the parameters in a mobility parameter group which is determined by the determination of a part of the parameters in said technological parameter group; and

a second step of adjusting a part of the parameters adjusted in said first step, and parameters which are required to be adjusted, excepting the parameters adjusted in said first step, using the genetic algorithm, based on the property measured data of various length of channels, with reference to an adjustment result of said first step.